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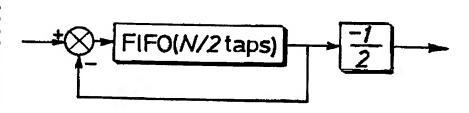
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(54) Title: REPETITIVE CONTROLLER AND DRIVE SERVO SYSTEM INCLUDING IT



(57) Abstract: The invention generally relates to the field of repetitive controllers for suppressing periodic signals with half-wave symmetry and, more specifically, to a repetitive controller having the form of a memory loop fed with a periodic signal of period NT and in which the memory size includes

N/2 memory elements, the feedback connection is negative and a factor of $-\frac{1}{2}$ is provided at the output of the memory loop. Such a repetitive controller may be used for instance in the disturbance compensation module of a drive servo system in a recording and reproducing apparatus including a head for recording data on a recording medium.

INTERNATIONAL SEARCH REPORT

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| A CLASS | FICATION OF SUBJECT MATTER | 101/10 | 37 03 930 | | | | | | | |
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| EPO-Internal | | | | | | | | | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | | | | | | | | | |
| Category • | Citation of document, with indication, where appropriate, of the re- | elevant passages | Relevant to claim No. | | | | | | | |
| А | US 2001/043427 A1 (CHEN YANGQUAN 22 November 2001 (2001-11-22) column 3, line 54 - column 4, li figure 5 column 6, line 18 - line 39 | 1-2 | | | | | | | | |
| Α | US 5 065 263 A (WAKABAYASHI NORI AL) 12 November 1991 (1991-11-12 column 6, line 44 - line 68 | 1-2 | | | | | | | | |
| Α . | US 5 784 272 A (SCHOOTSTRA GERRI 21 July 1998 (1998-07-21) claims 1,2 | 1 | | | | | | | | |
| A | US 2001/005342 A1 (AKKERMANS ANTET AL) 28 June 2001 (2001-06-28) column 2, line 25 - line 62; fig | 1,2 | | | | | | | | |
| Furth | er documents are listed in the continuation of box C. | X Patent family members are listed | in annex. | | | | | | | |
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| other means occurrent published prior to the international filing date but in the art. | | | | | | | | | | |
| | clual completion of the international search | *å* document member of the same patent family Date of mailing of the international search report | | | | | | | | |
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INTERNATIONAL SEARCH REPORT

Internation No PCT/IB 03/05930

| | | | 101/10 03/03930 | | | |
|------|--------------------------------|----|------------------|----|-------------------------|---------------------|
| | tent document in search report | | Publication date | | Patent family member(s) | Publication date |
| US | 2001043427 | A1 | 22-11-2001 | SG | 96594 A1 | 16-06-2003 |
| US | 5065263 | Α | 12-11-1991 | JP | 1293411 A | 27-11-1989 |
| | | | | JP | 2001224 C | 20-12-1995 |
| | | | | JP | 7031550 B | 10-04-1995 |
| | | | | JP | 2108288 A | 20-04-1990 |
| | | | | JР | 2586605 B2 | 05-03-1997 |
| | | | • | JP | 2134777 A | 23-05-1990 |
| | | | | JP | 2621439 B2 | 18-06-1997 |
| | | | | DE | 68919903 D1 | 26-01-1995 |
| | | | | DE | 68919903 T2 | 06-07-1995 |
| | | | | EP | 0342973 A2 | 23-11-1989 |
| US ! | 5784272 | A | 21-07-1998 | DE | 69524729 D1 | 31-01-2002 |
| | | | | DE | 69524729 T2 | 22-08-2002 |
| | | | | EP | 0737331 A1 | 16-10-1996 |
| | | | | WO | 9613763 A2 | 09-05-1996 |
| | | | | JP | 9507601 T | 29-07-1997 |
| US 2 | 2001005342 | A1 | 28-06-2001 | CN | 1347554 T | 01-05-2002 |
| | | | | WO | 0143125 A2 | 14-06-2001 |
| | | | | ΕP | 1179211 A2 | 13-02-2002 |
| | | | | JP | 2003516599 T | 13-05-2003 |
| | | | | TW | 509926 B | 11-11-2002 |